

CLAIMS

1. A closed mold method of making a composite having a barrier layer, the method comprising:

providing a mold;

5 applying and curing a layer of gel coat on an inside surface of the mold;

applying and curing a layer of barrier composition over the gel coat, the barrier composition comprising:

about 10 to about 50 wt% vinyl ester resin;

about 15 to about 60 wt% polyester resin;

10 0 to about 30 wt% monomer;

about 1 to about 15 wt% thickening agent;

about 0.1 to about 5 wt% accelerators;

about 1 to about 25 wt% filler; and

a catalyst;

15 applying a layer of fiberglass reinforcement over the barrier composition;

applying resin to the fiberglass reinforcement;

closing the mold;

curing the resin; and

opening the mold and removing the composite,

20 wherein the composite has an improved surface finish compared to a composite made with a closed mold process without the barrier composition.

2. The method of claim 1 wherein the mold is a two piece mold, and wherein the mold is closed by moving the two pieces together.

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3. The method of claim 2 further comprising applying pressure to the mold.

4. The method of claim 2 wherein the resin is applied after the mold is closed, and wherein the resin is applied under pressure.

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5. The method of claim 4 wherein a vacuum is applied after the mold is closed.

6. The method of claim 1 wherein the mold is closed by sealing a vacuum bag around the mold.

7. The method of claim 6 further comprising applying a vacuum to the vacuum bag.

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8. The method of claim 7 wherein the resin is applied after the vacuum is applied.

9. The method of claim 1 wherein the closed mold method is a closed mold process selected from compression molding, vacuum bag molding, vacuum infusion molding, or resin transfer molding.

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10. The method of claim 1 wherein the accelerators comprise at least one material selected from dimethyl para-toluidine, dimethyl aniline, diethyl aniline, dimethyl acetalacetamide, cobalt octoate, potassium octoate, copper naphthanate, quaternary ammonium salts, or mixtures thereof.

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11. The method of claim 1 wherein the fillers comprise a material selected from hollow spheres or microspheres, wollastonite fibers, mica, potassium aluminum silicate, calcium silicate, calcium sulfate, aluminum trihydrate, or combinations thereof.

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12. The method of claim 11 wherein the hollow spheres or microspheres comprise a material selected from silicate glass, ceramic, plastic, or combinations thereof.

13. The method of claim 1 wherein said thickening agent is a thixotropic clay.

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14. The method of claim 1 further including fumed silica.

15. The method of claim 1, wherein the catalyst is selected from methyl ethyl ketone peroxide, benzoyl peroxide, or cumyl hydroperoxide.

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16. The method of claim 1, wherein the barrier composition comprises:
about 10 to about 20 wt% vinyl ester resin;
about 40 to about 60 wt% polyester resin;
about 5 to about 10 wt% monomer;
5 about 1 to about 15 wt% thickening agent;
0 to about 2 wt% fumed silica;
about 0.1 to about 5 wt% accelerators; and
about 1 to about 25 wt% fillers.
- 10 17. The method of claim 1, wherein the barrier composition comprises:
about 20 to about 50 wt% vinyl ester resin;
about 15 to about 40 wt% polyester resin;
about 5 to about 10 wt% monomer;
about 1 to about 15 wt% thickening agent;
15 0 to about 2 wt% fumed silica;
about 0.1 to about 5 wt% accelerators; and
about 1 to about 25 wt% fillers.
18. The method of claim 1, further comprising applying a second layer of fiberglass
20 reinforcement, applying resin to the second layer of fiberglass reinforcement, and curing
the resin.
19. The method of claim 1, further comprising applying and curing a second layer of
barrier composition.
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20. A composite having an improved surface finish made by the method of claim 1.
21. The composite of claim 20, wherein the barrier composition comprises:
about 10 to about 20 wt% vinyl ester resin;
30 about 40 to about 60 wt% polyester resin;
about 5 to about 10 wt% monomer;

about 1 to about 15 wt% thickening agent;
0 to about 2 wt% fumed silica;
about 0.1 to about 5 wt% accelerators; and
about 1 to about 25 wt% fillers.

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22. The composite of claim 20, wherein the barrier composition comprises:
about 20 to about 50 wt% vinyl ester resin;
about 15 to about 40 wt% polyester resin;
about 5 to about 10 wt% monomer;
10 about 1 to about 15 wt% thickening agent;
0 to about 2 wt% fumed silica;
about 0.1 to about 5 wt% accelerators; and
about 1 to about 25 wt% fillers.